

THE EFFECTS OF INSTRUCTIONS ON BILINGUAL MEMORY FOR METAPHOR

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Introduction

While on vacation in Paris, a young woman with her family decided to try her French skills out in a small cafe. She ordered the "tourist" menu for herself and the rest of the group who didn't know anything but pidgin French. She believed the meal to include a meat entree, salad and some sort of flaming dessert. The group finished the salad and entree and then waited for the dessert. When the dinner conversation ran out and dessert still hadn't arrived, the young woman asked the waitress (who knew no English) if the dessert was ready. The waitress looked thoroughly confused. So the woman pointed at the item in question on the menu. The waitress explained that the "allumettes" were the french fries that had come with the meat. The woman was quite embarrassed and had no appetite for dessert. That woman was this researcher.

"Allumettes" had been used metaphorically to refer to the shape of "matchstick" potatoes. I had translated the entire phrase relative to the literal meaning of the verb "allumer"--to light. This incident became an inspiration for the present study which brings together two lines of research: bilingual memory and memory for metaphor.

Metaphor and Bilingualism: Hypotheses

The present study focuses on memory for metaphors in bilinguals. It was hypothesized that subjects translating metaphors should have a richer representation of those metaphors in memory and therefore perform better on a cued recall test than subjects translating non-metaphorical sentences. Subjects translating metaphors should perform better than subjects doing a shallow processing task of copying and counting the vowels and consonants of metaphorical or non-metaphorical sentences where the translation representation in memory is not there. Subjects translating the figurative meaning of metaphors should perform better on a recall test than those translating the literal meanings if the latter are processing only the literal meanings. If the subjects doing the copy and count task are processing the meanings of the sentences without specific instructions to do so, those copying metaphorical sentences and counting vowels

and consonants should recall better than those copying non-metaphorical sentences and counting vowels and consonants.

Instructions can be considered the context in which the metaphor is embedded (Burbules, et al., 1989). In order to test the effect of instructions as context, this study included three conditions: subjects were given specific instructions as to how to translate (either literal or figurative) or they were given no specific instructions but were simply asked to translate. Context in this case may restrict the extent of processing. Therefore, subjects specifically instructed to translate the figurative meanings of the metaphors should perform better on a recall test than subjects not given the specific instructions.

Surface structure differences alone do not change the extent of encoding (Rosenberg and Simon, 1977). Therefore, there should be no variation in recall performance between different second languages (Spanish and French) for comparable groups (e.g., groups translating figurative meanings).

Method

Materials

Acquisition task: For the translation conditions, two lists were prepared by a person with native-speaker ability in the second language. One consisted of 20 metaphorical sentences translated into French or Spanish from the metaphors prepared by Katz, Paivio, Marschark & Clark (1988). Culturally novel metaphors were chosen with a vocabulary appropriate for the intermediate language level as determined by agreement between two language instructors. They were all simple sentences of subject noun-verb (etre, ser)-predicate noun and/or adjective (e.g. L'amour est une fleur). For the French and Spanish bilinguals, one group of subjects (Met-Fig) received this list of metaphors in French or Spanish with specific instructions to translate the figurative meanings of the metaphors into English. Another group (Met-Lit) received this same list with specific instructions to translate the literal meanings of the metaphors into English. A third group (Met-Trans) received this same list of metaphors with only the instructions to translate them into English.

The other list consisted of 20 non-metaphorical sentences in French or Spanish utilizing the same vocabulary as the above list. Each sentence began with the same noun as the corresponding sentence in the metaphor list. The list included instructions to translate into English with an example (Nonmet-Lit). No noun or adjective was used more than once in each list. The language of the instructions for both language groups in each condition was English.

For the copy and count conditions, the same two lists as described above were used with the instructions to copy the sentences and count the vowels and consonants (Met-CC and Nonmet-CC). The language of these instructions in both conditions for both language groups was English.

Recall task: Twenty incomplete sentences each were prepared from the acquisition lists above--one metaphor, one non-metaphor. Ten of the cues were the subject nouns, 10 were the predicates. The form of the test was not varied across subjects. All subjects were asked to complete the sentences as they were remembered from the original acquisition list.

Subjects and Procedure

In the language classroom, students of French and Spanish in their third semester of language study or above (excluding native speakers) were given one of the acquisition lists described above to translate or to copy and count the consonants and vowels. When a subject had finished, he/she recorded the time taken to complete the task on the list.

When all subjects had completed the acquisition task, a questionnaire was given to all subjects as a filler task and to double check that the subject had the required second language experience. This was the self-evaluation used by Durgunoglu & Roediger (1987). Subjects rated themselves on a scale of 0-5 for the following: reading English, reading the second language, understanding spoken English, understanding the spoken second language, speaking English and speaking the second language.

When all the questionnaires were completed and turned in, the cued recall test was given. Subjects who performed the metaphor acquisition task received a metaphor cued recall list. Similarly, subjects who performed the non-metaphor acquisition task received a non-metaphor cued recall list. After three minutes, the cued recall test was collected and the experimenter had the students do language drills (conjugating a list of French or Spanish verbs in different tenses) for 10 minutes as a filler before the delayed recall test. The same cued recall test was then given in the same manner as above. After three minutes the test was collected. The experimenter later scored the translations and recall tests for accuracy.

Results

The dependent measures of interest were: Translation coding, completion time for the acquisition task, and number of correct responses for the two cued recall tests. All reported F s are significant at the $p < .05$ level.

Translation

Translation coding was used as a manipulation check for instructions. Frequencies were obtained for each of the categories of acquisition sentences (e.g. correct literal, correct figurative). Subjects in each of the translation groups were doing the specified task. Those in the Met-Fig group did for the most part translate figurative meanings (8.5 out of 20 possible correct figurative sentences). The other three translation groups, Met-Lit, Met-Trans and Nonmet-Lit, for the most part translated literal meanings (12.9, 13.1 and 15.4 out of a possible 20 adequate literal translations respectively). Without specific instructions as how to translate, those in the Met-Trans group translated the literal rather than the metaphorical meanings of metaphors.

Time

An ANOVA for a 2-factor design, with language and group as between-subjects factors, was done for the time taken (see Figure 1 next page). No effect of language was found. There was a significant effect of group, $F(5,187) = 25.94$, $MSe = 12.87$. There was a significant difference between the translation groups combined (Met-Fig, Met-Lit, Met-Trans, Nonmet-Trans) and the copy and count groups combined (Met-CC and Nonmet-CC), $F_{comp}(1,182) = 93.21$, $MSe = 12.87$. More time was spent in the Met-CC and Nonmet-CC groups. There was no significant difference between the Met-CC and Nonmet-CC groups. There was a significant difference between the Met-Fig group and the Met-Lit group combined with the Met-Trans group, $F_{comp}(1,182) = 33.86$, $MSe = 12.87$. More time was spent in the Met-Fig group.

Recall

This was a mixed 4-factor design with 4 independent variables: language and group (between subjects) and 2 repeated measures, part of sentence (subject or predicate response) and test (1 or 2). An ANOVA was done for the number of correct responses (see Table 1 next page).

Figure 1

Translation Time

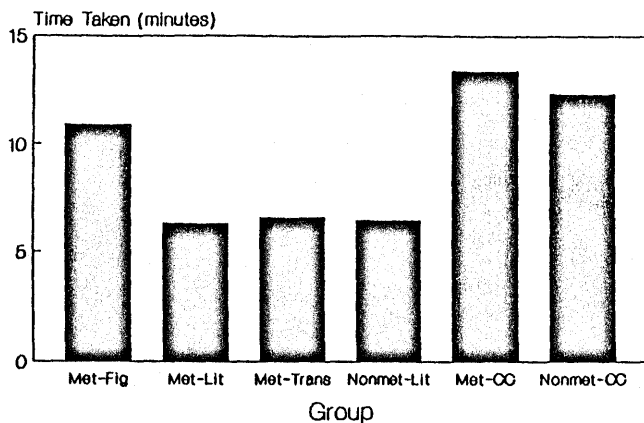


Table 1

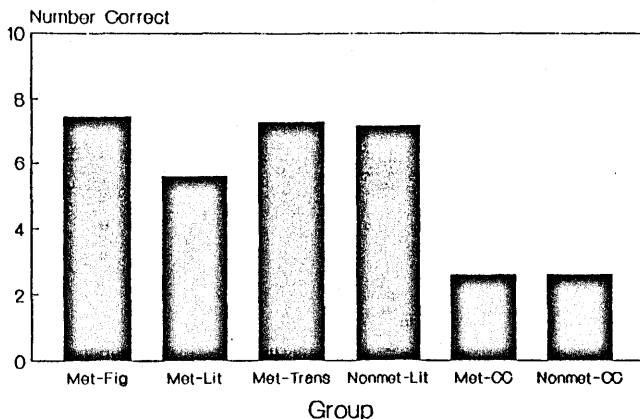
Experiment One: Mean Recall Correct Across Languages (Out of 20)

Group	Recall One		Recall Two	
	Subj	Pred	Subj	Pred
Met-Fig	7.28	7.03	7.91	7.61
Met-Lit	5.67	5.13	6.01	5.52
Met-Trans	6.78	7.13	7.45	7.69
Nonmet-Lit	6.50	7.29	7.18	7.68
Met-CC	2.56	2.19	2.98	2.68
Nonmet-CC	2.91	1.98	3.28	2.26

There was a significant effect for group. $F(5,172)=37.61$, $MSe=15.19$. This effect for group was repeated for French and Spanish, subject and predicate, test 1 and 2. See Figure 2 next page. There was a significant difference between all the groups translating (Met-Fig, Met-Lit, Met-Trans and Nonmet-Lit) and both the copy and count groups (Met-CC and Nonmet-CC), F comp. $(1,172)=44.99$, $MSe=16.19$. There were more correct answers in the translation groups. There was no significant difference between all the groups working with metaphors combined (Met-Fig, Met-Lit, Met-Trans and Met-CC) and all the groups

Figure 2

Recall Means



working with non-metaphors combined (Nonmet-Lit and Nonmet-CC). There was a significant difference between the Met-Lit group and all other translation groups (Met-Fig, Met-Trans and Nonmet-CC), $F_{comp. (1,172)}=4.09$, $MSe=16.19$. There were fewer correct answers in the Met-Lit group.

Discussion

As there was no difference in time or recall performance as a function of the language of the materials any differences found may be due to a general language process shared by French and Spanish.

It was concluded from the results that subjects did not go beyond the task instructions: they processed the meanings of the sentences only as far as the task demanded.

No significant differences were found between subjects translating metaphors and subjects translating non-metaphors for these groups. When subjects process the metaphors they process

and encode only that interpretation of the meaning and no others. This finding is consistent with those of Burbules et al. (1989), Marschark and Hunt (1985), and others.

The significant difference between subjects translating and subjects copying and counting suggests that subjects were doing something differently in the translation group from those in the copy and count groups. Since those in the latter groups actually spent more time on the acquisition task than did those in all the other groups, time spent working with the materials does not seem to be a factor in recall of those materials. Furthermore, since the subjects did not know their memory would be tested, there probably were no conscious differences in the processing of the materials other than those demanded by the task instructions. Therefore, translation demands a different sort of processing than does copying and counting. One such difference may be a representation of that translated meaning in memory.

The results supported the hypothesis that subjects translating the figurative meaning of metaphors should perform better on a recall test than those translating the literal meanings. Subjects translating the literal meaning of the metaphors did more poorly on the recall test than the other translation groups. However, there were no differences among the remaining translation groups (the Met-Fig, Met-Trans and Nonmet-Lit groups). So the Met-Lit group performed differently from both the Met-Fig group and the Nonmet-Lit group. The Met-Fig group may have been processing the materials in a similar fashion (at least in some equally effective way) as the Nonmet-Lit group and the Met-Trans group.

This similarity of processing for the three groups would indicate that processing metaphors does not involve an intermediate step, either a literal interpretation or a metaphor as simile (Keysar, 1989, and Glucksberg & Keysar, 1990). The Met-Trans group recalled as well as the Met-Fig group but better than the Met-Lit group. The frequencies for translation codes indicate that the Met-Trans group generally translated the literal interpretation of the metaphors. Yet the Met-Lit group which also translated the literal interpretation of the metaphors performed in recall the worst of the four translation groups.

No matter how long the subjects spent on the acquisition task, they recalled better in the Met-Fig group than in the copy and count groups. In addition, these results support Glucksberg and Keysar's class inclusion notion of metaphor and the notion of a one-step processing of metaphors. When giving the figurative meaning of metaphors, subjects are using a process familiar to them for processing metaphors; they encode topics

(subjects) as categories and vehicles (predicates) as exemplars. Similarly, when asked to translate non-metaphors literally, subjects use the familiar process: subjects as exemplars and predicates as categories. For example, in the metaphor "Truth is a labyrinth," truth is encoded as a category and labyrinth as an exemplar (truth is not always conceived of as a labyrinth). In the non-metaphor "Truth is an ideal", truth is encoded as an exemplar of the category ideal. The equivalent recall for both these types of tasks reinforces the idea of each being a one-stage process.

These results suggest that when confronted with a metaphor, the processing of the figurative meaning is automatic without processing the literal meaning first. When the Met-Lit group was forced to process the literal meaning, this process interfered with normal processing, resulting in poorer recall performance. This interference could be described as due to opposing processes: Subjects as categories and predicates as exemplars versus subjects as exemplars and predicates as categories. Those subjects given no specific instructions on how to translate gave the literal meanings because, in the absence of specific instructions otherwise and without any emphasis on the metaphorical nature of the sentences, when a student is asked in the context of a language class to translate, that is what is meant--a word-for-word translation, especially at this intermediate level of language acquisition.

The subjects in the Met-Fig and Met-Lit groups were explicitly made aware of the metaphorical nature of the sentences. However, in the Met-Trans group, subjects were only told to "Translate the following metaphors." The nature of the sentences is neither emphasized nor made explicit. Therefore, there is no interference from the automatic metaphorical process in this latter group because there is no demand made for the subject to do other than translate literally. In other words, in the absence of a demand to process metaphors literally, and in the presence of a strong practice effect, subjects can translate the literal meaning of metaphors without detriment to encoding processes and subsequent recall performance. But in the presence of a demand to process metaphors literally (as per instructions) subjects can only do so with interference in encoding processes and recall performance.

These results may be particularly pertinent in the area of teaching a second language. So often the preferred language task at even the beginning levels is translation. These results indicate that when beginning bilinguals translate they do so in an automatic, well-practiced, word-for-word manner. They translate without thinking about what it is they are saying in the final translation. To say "Love is a flower" doesn't make literal sense. But when asked to translate metaphors, this is

exactly what subjects (students) did. O'Brien et al. (1986) postulate that during the process of attaining language proficiency, a reasoning shift occurs. This shift may also be found when one jumps from a purely literal understanding of a language to a figurative one. That leads to the question of second-language learners. Have they gone through both shifts in the second language?

It would seem more appropriate to concentrate on vocabulary and grammar at the beginning levels without the use of translation-type activities. Once the vocabulary and grammar is mastered, and the "reasoning shift" has occurred, then the intermediate courses could introduce the skill of translation, including various types of figurative language. Translation should be taught as a skill, not used as an exercise. In this way, perhaps the less meaningful word-for-word translations at the intermediate level of language study, as encountered in this experiment, can be avoided.

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